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| 09/438,491      | 11/12/1999  | TOSHIYUKI YOSHIHARA  | 684.2935            | 9399             |

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EXAMINER

SCHWARTZ, JORDAN MARC

ART UNIT PAPER NUMBER

2873

DATE MAILED: 04/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/438,491

Applicant(s)

YOSHIHARA, TOSHIYUKI

Examiner

Jordan M. Schwartz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 2-10, 12-17, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2, 6-8, 12, 13, 15-17, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 3-5, 9, 10 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

***Detailed Action***

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 2 and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Morooka patent no. 5,623,364.

Morooka reads on these claims by disclosing the limitations therein including the following: an aberration changing optical system (column 5, line 37) comprising an optical element (column 5, line 34 re the meniscus lens); this optical element rotatable about a rotational axis which is the optical axis (column 5, line 34 i.e. since it is rotatable about a point on the optical axis then it must inherently be rotated about the optical axis); the optical element tiltable relative to the optical axis (abstract); and a projection system (column 12, line 58). The meniscus lens of Morooka will inherently have an optical power in only one direction, this being reasonably based upon this lens being disclosed as a meniscus lens i.e. a non-anamorphous optical lens which are known in the art to have an optical power in one direction. It is believed that the optical element of Morooka will inherently have an optical power as claimed in claim 7, this being

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reasonably based upon Morooka disclosing this lens to reduce aberration variation (column 5, line 37).

Claims 12-13, 16-17 and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Omura patent no 6,512,641.

Omura reads on these claims by disclosing the limitations therein including the following: a projection optical system for projecting a device pattern onto a wafer (column 1, lines 11-28) comprising a projection optical system being disposed between the pattern and wafer (Figures 8 and 12b); an optical element for correcting aberration disposed between the pattern and wafer (Figures 8 and 12b, column 27, lines 1-7 re any of lenses LA1 to LA5); the lens inclined to the optical axis (column 27, lines 1-7); a plurality of these lenses (column 27, lines 1-7); and the use of quartz or fluorite (column 15, line 5). Any of lenses "LA1 to LA5" of Omura will inherently have an optical power in only one direction, this being reasonably based upon these lenses not being disclosed as anamorphic optical lens and therefore, non-anamorphic lenses are known in the art to have an optical power in one direction. It is believed that at least one of the optical elements LA1 to LA5 will inherently have an optical power as claimed in claim 17, this being reasonably based upon Omura disclosing these lenses to reduce aberrations (column 27, line1-7).

Claims 12, 17 and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuji patent no 5,424,552.

Tsuji reads on these claims by disclosing the limitations therein including the following: a projection optical system for projecting a device pattern onto a wafer

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(column 5, line 45 to column 6, line 32, column 12, line 49 to column 13, line 24) comprising a projection optical system being disposed between the pattern and wafer (Figure 36, "PL"); an optical element for correcting aberration disposed between the pattern and wafer (Figure 36, element "333" and column 57, lines 41-47); and the lens inclined to the optical axis (column 57, lines 41-47). It is believed that the optical element "333" will inherently have an optical power as claimed in claim 17, this being reasonably based upon Tsuji disclosing this lens to reduce aberrations.

Claims 12, 15, 17 and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Tokuda et al publication number 2002/0149756.

Tokuda et al reads on these claims by disclosing the limitations therein including the following: a projection optical system for projecting a device pattern onto a wafer (abstract, paragraphs 0002, 0006) comprising a projection optical system being disposed between the pattern and wafer (Figures 1 and 14, paragraph 0042); an optical element for correcting aberration disposed between the pattern and wafer (Figures 1 and 14, paragraphs 0011 and 0042 re element "15"); the lens inclined to the optical axis (paragraph 0011); and a flat parallel plate inclined in an opposite direction (paragraph 0062). It is believed that the optical element "15" will inherently have an optical power as claimed in claim 17, this being reasonably based upon Tokuda et al disclosing this lens to reduce aberrations.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morooka.

Morooka discloses as is set forth above including the lens for use in a projection exposure apparatus (abstract) but does not specifically disclose the lens composed of either quartz or fluorite. The examiner takes Judicial Notice that it is well known in the art of projection exposure apparatuses for such systems to use lenses of either or both quartz or fluorite in order to provide the required patterning onto a substrate. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the projection exposure apparatus of Morooka as comprising either quartz or fluorite since it is well known in the art of projection exposure apparatuses for such systems to use lenses of either or both quartz or fluorite in order to provide the required patterning onto a substrate.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al or Tokuda et al.

Tsuji et al and Tokuda et al disclose as is set forth above including the lens for use in a projection exposure apparatus (abstract of both) but do not specifically disclose the lens composed of either quartz or fluorite. The examiner takes Judicial Notice that it is well known in the art of projection exposure apparatuses for such systems to use lenses of either or both quartz or fluorite in order to provide the required patterning onto a substrate. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the projection exposure apparatus of either

Tsuji et al or Tokuda et al as comprising either quartz or fluorite since it is well known in the art of projection exposure apparatuses for such systems to use lenses of either or both quartz or fluorite in order to provide the required patterning onto a substrate.

***Allowable Subject Matter***

Claims 3-5, 9-10 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: with respect to the allowable subject matter, none of the prior art either alone or in combination disclose or teach of the claimed combination of limitations to warrant a rejection under 35 USC 102 or 103. Specifically, with reference to claim 3, none of the prior art either alone or in combination disclose or teach of the claimed aberration changing optical system comprising an optical element with refractive powers in two orthogonal directions or having a power in only one direction, the element rotatable about a rotation axis, which is the optical axis, the element tiltable relative to the optical axis, and specifically further comprising a plurality of rotatable and tiltable optical elements selectively used to change an aberration. Specifically, with reference to claim 4, none of the prior art either alone or in combination disclose or teach of the claimed aberration changing optical system comprising an optical element with refractive powers in two orthogonal directions or having a power in only one direction, the element rotatable about a rotation axis, which is the optical axis, the element tiltable relative to the optical axis, and specifically further comprising a second optical element having the

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structure and positioning as claimed in claim 4. Specifically, with reference to claim 5, none of the prior art either alone or in combination disclose or teach of the claimed aberration changing optical system comprising an optical element with refractive powers in two orthogonal directions or having a power in only one direction, the element rotatable about a rotation axis, which is the optical axis, the element tiltable relative to the optical axis, and specifically further comprising a parallel flat plate being rotatable and tiltable as claimed. Specifically, with reference to claims 9-10, none of the prior art either alone or in combination disclose or teach of the claimed aberration changing optical system comprising an optical element with refractive powers in two orthogonal directions or having a power in only one direction, the element rotatable about a rotation axis, which is the optical axis, the element tiltable relative to the optical axis, and specifically further with this element in a projection optical system for projecting a pattern of a mask onto a substrate or for transferring a device pattern onto a wafer. Specifically, with reference to claim 14, none of the prior art either alone or in combination disclose or teach of the claimed projection system for projecting a pattern onto a wafer comprising a projection optical system as claimed, an aberration correcting optical element having the refractive power as claimed, disposed between the pattern and wafer, being inclined with respect to an optical axis, and specifically further a second optical element having the structure and positioning as claimed in claim 14.

### ***Response to Arguments***

Applicant's arguments with respect to the above rejected claims have been considered but are moot in view of the new ground(s) of rejection set forth above.



***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jordan M. Schwartz whose telephone number is (703) 308-1286. The examiner can normally be reached on Monday to Friday (8:00-5:30), alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached at (703) 308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)

308-0956.

A handwritten signature in black ink, appearing to read 'JMS', is positioned above the typed name.

Jordan M. Schwartz  
Primary Examiner  
Art Unit 2873  
April 25, 2003